Class D Audio Amplifier Board - TDA7492 User's Guide

Table of Contents

NOTES:

Product Version : Ver 1.0

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CLASS D AUDIO AMPLIFIER BOARD - TDA7492 USER'S GUIDE

Chapter 1. Overview

1.1 Overview

Welcome to use this 2*100W，2*50W，2*25W Class-D audio amplifier board series by Sure Electronics.

TABLE 1-1 PRODUCT LIST

Product No.	Rating Output Power Per Channel
AA-AB32189	100W @6 Ohm
AA-AB32174	50W @6 Ohm
AA-AB34165	25W @6 Ohm

They integrate ST's high performance TDA7492 supporting dual channel audio amplification. Both of channels are capable of outputting nominal power simultaneously and continuously.

They integrate an external extensible interface to connect the matching product of a volume control board and a rotary encoder board for volume control. It's suitable for amplifier enthusiasts or hobbyists to finish a complete amplifier system.

Resistance and capacity components of high quality, including X7R ceramic capacitors and lower ESR electrolytic capacitors, are used to gain the perfect timber, finally realize high S/N ratio, low THD+N, wide frequency response range etc.

Briefly, the power supply range and heat sink performance of each product distinguishes. You may make the proper choice to meet your application needs.

FIGURE 1-1 FRONT VIEW

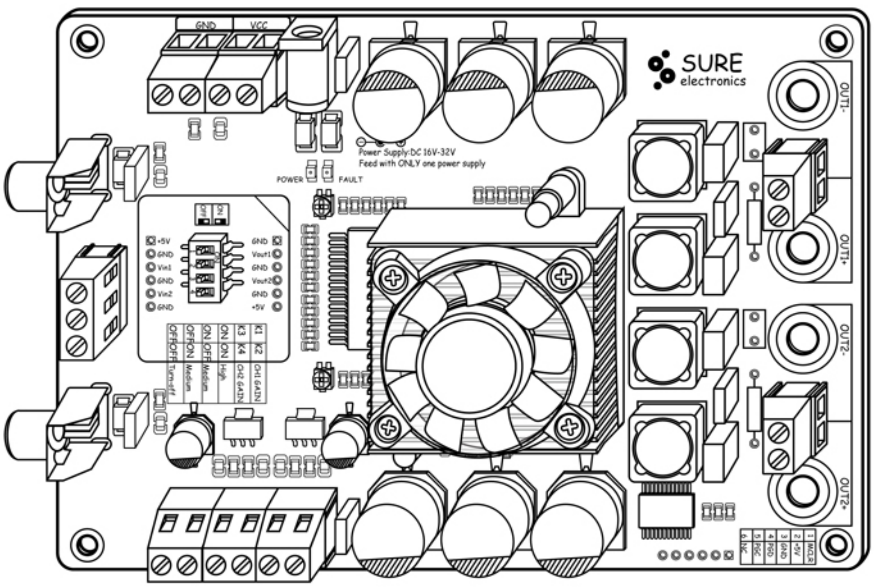
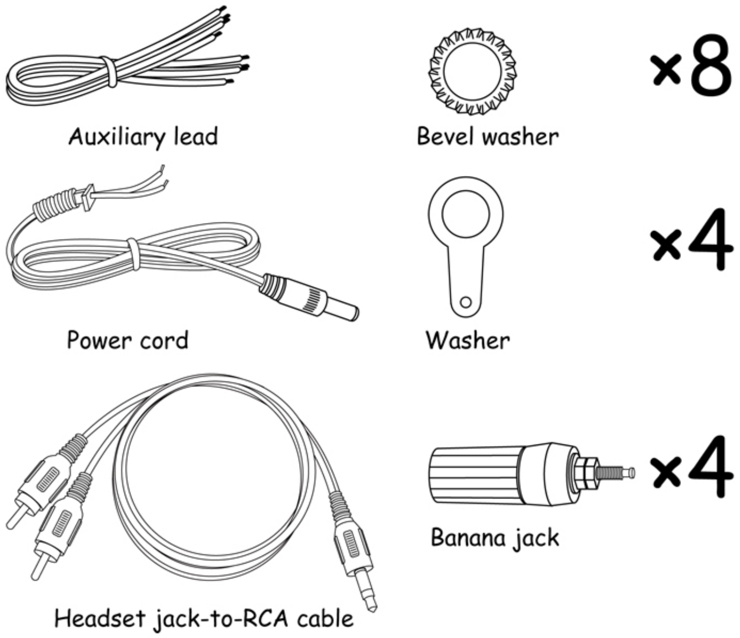


FIGURE 1-2 ACCESSORIES PACKAGE (OPTIONAL)



Note: The diagrams above are used for reference only.

1.2 Features

- A perfect "Class D" architecture
- Frequency response: 20Hz to 20KHz(±3dB)
- Four selectable, fixed gain settings of nominally 25.6 dB, 31.6 dB, 35.1 dB and 37.6 dB.
- Single end audio signal input
- Over/under voltage protection
- Over current protection
- Over temperature protection

1.3 Applications

It is the ideal solution for any sound reinforcement installation or application needing an affordable compact PA system.

- Background Music Systems
- Vending machines
- Lifts
- Interactive kiosks
- Home DIY
- Car audio

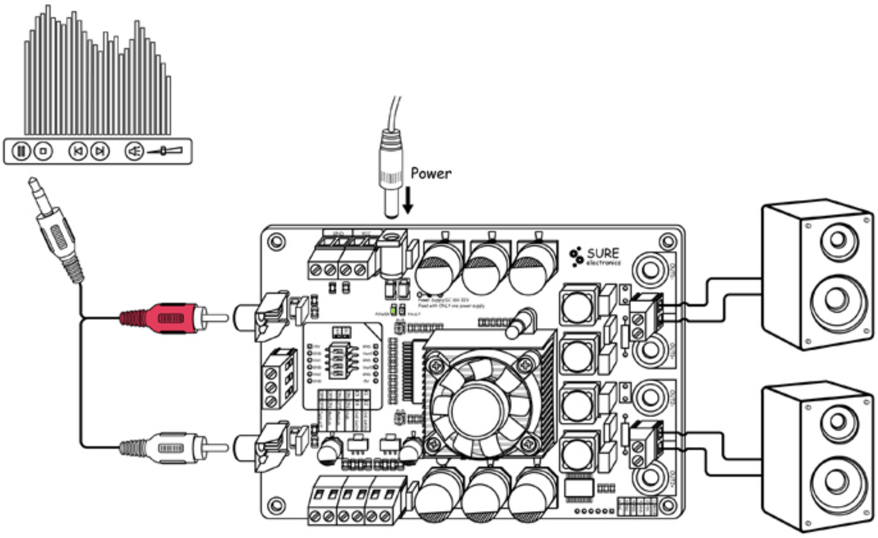
1.4 Benefits

- Mounting holes facilitate installation and fixing
- Several wiring methods facilitate connection：RCA Socket (Default),Terminal Block(Optional)
- Excellent design of the power ports which allows you to connect multiple amplifier boards in series (Terminal Block Optional).
- Excellent heat dissipation eliminates the requirement of an extra heat sink.

1.5 Quick Start

Suggested connection is shown in figure 1-3.

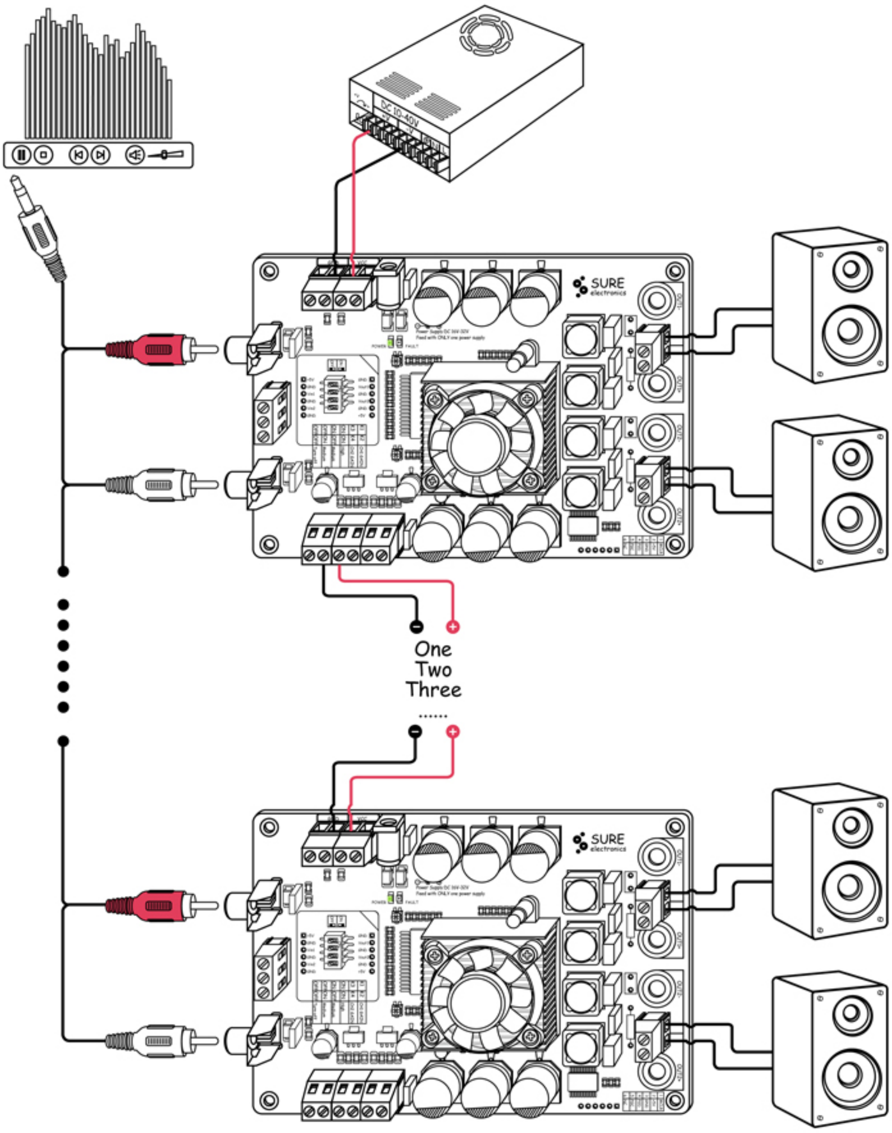
FIGURE 1-3 CONNECTION SCHEMATIC



Note: Please observe the following steps to complete verification so as to ensure the products are intact during transit.

1. Open the amplifier package and make sure the product is intact (No missing or damaged components and no deformation.
2. Please observe the connection schematics when connecting the amplifier board. Use a nearby sound source, such as MP3 or CD player to have a trial. This amplifier board can be deemed as qualified if you can hear the sound corresponding to that sound source

FIGURE 1-4 CASCADING SCHEMATIC (OPTIONAL)



Note:	GND should be grounded or connected to the housing of the device.

Chapter 2. Hardware Detail

2.1 Power Connection

To power the amplifier board, use either jack J9 or terminal blocks J8 (optional). Pay attention to the polarity when connecting power supply.

FIGURE 2-1 POWER CONNECTION

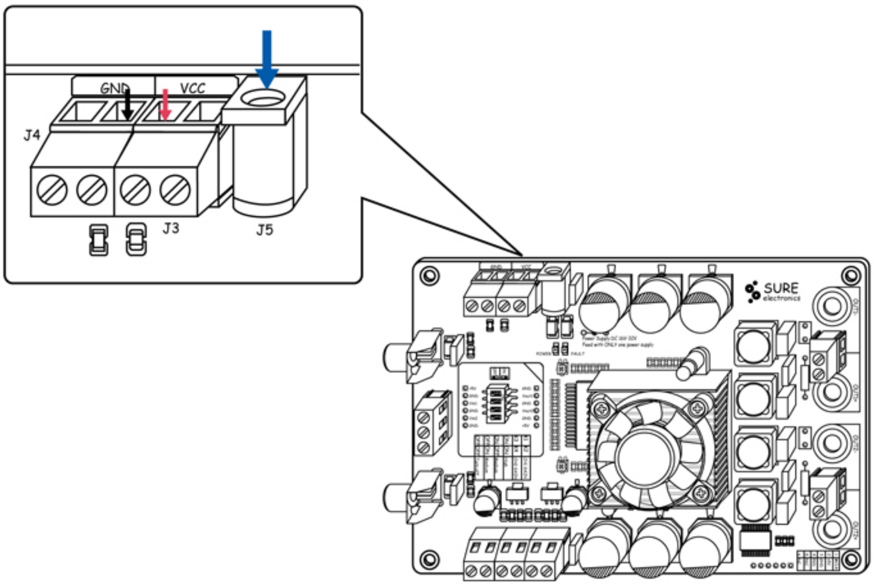


TABLE 2-1 POWER CONNECTION

Connector Mark			Description
Jack	J9		DC power supply socket
Terminal Blocks	J8	VCC	The positive of power supply socket
		GND	The negative of power supply socket

Note:
1. You are allowed to use only one way to power the amplifier board at a time.
2. The maximum supply voltage shall be referred to Chapter 3.

2.2 Input Connections

You may use RCA connectors to input audio signal.

FIGURE 2-2 INPUT CONNECTION

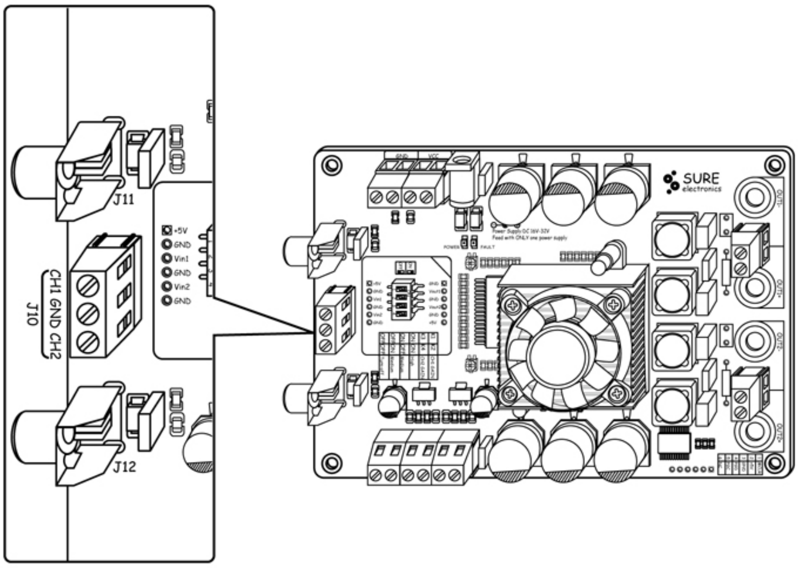


TABLE 2-2 INPUT CONNECTION

Connector Mark		Channel Description
RCA connector	J3	Channel 1 Input
	J4	Channel 2 Input
Terminal Blocks（Optional）	J1	Channel 1 Input
		GND
	J2	GND
		Channel 2 Input

> **Note:** You are allowed to feed only one group (dual channel) of audio signal to the amplifier board at a time.

2.3 Output Connections

You can use either terminal blocks or banana connectors (optional) to output audio signal.

FIGURE 2-3 OUTPUT CONNECTION

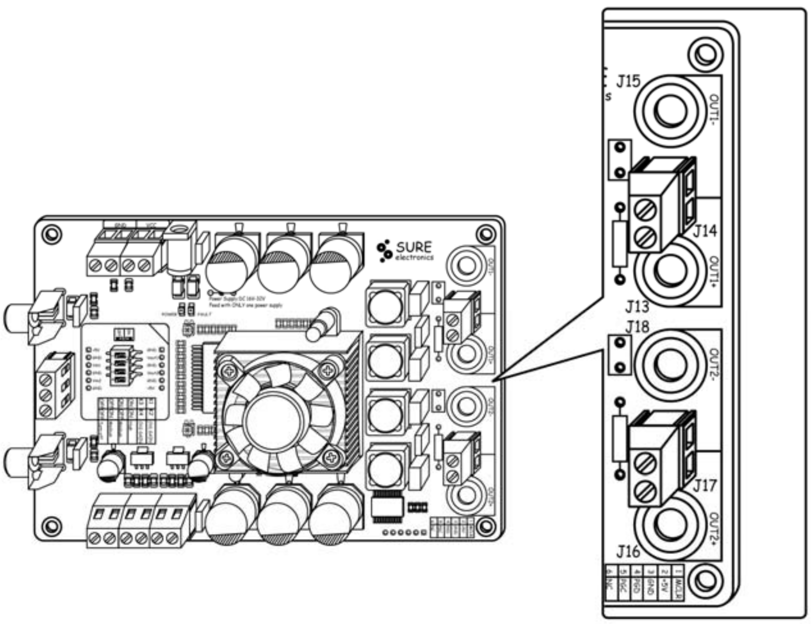


TABLE 2-3 OUTPUT CONNECTION

Connector Mark		Description
Banana Connectors	J15	Negative Output of Channel 1
	J13	Positive Output of Channel 1
	J18	Negative Output of Channel 2
	J16	Positive Output of Channel 2
Terminal blocks*	J14	Output of Channel 1
	J17	Output of Channel 2

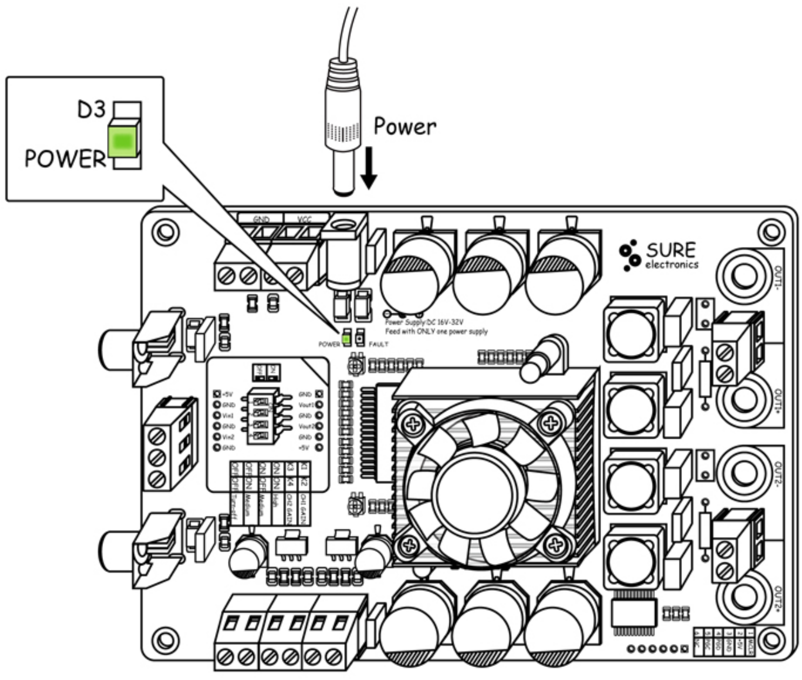
Note:

1. Never connect more than one group of speaker to the audio output
2. Never connect CH1_OUT- 、CH2_OUT- together since they belong to different NETs.
3. Refer to on-board descriptions for connection details.

2.4 LED Indicators

This amplifier has 1 power LED indicator which is marked as “PWR (D3)”. “Power (D3)” will be illuminated in green when power-up.

FIGURE 2-4 LED INDICATOR



2.5 Volume Control

The on-board external extensible interface allows for the connection of a rotary encoder board and a volume control board for volume control. The two boards are not provided here but as another product (product No.: AA-AA11117) sold on Sure’s webstore. If you use the two boards, please set K1 and K2 of the on-board DIP switch SW1 OFF. Not using these two boards, you may also adjust the volume by setting the DIP switch SW1. The gain is factory pre-set to low. This can prevent chip from permanent damage caused by overheat when input signal amplitude is over range. On the other conditions of gain setting, it is recommended that the output signal amplitude is no larger than the power

supply voltage once the input signal reaches the peak.

Take AA-AB32189 for example, the maximum amplitude of the input signal is no more than 320mV RMS when power supply voltage is 36V, load impedance is 6 ohm and the gain is set at 37.6 dB. The other circumstances can be referred to the input sensitivity from TABLE 3-1 ELECTRICAL CHARACTERISTICS

FIGURE 2-5 VOLUME CONTROL

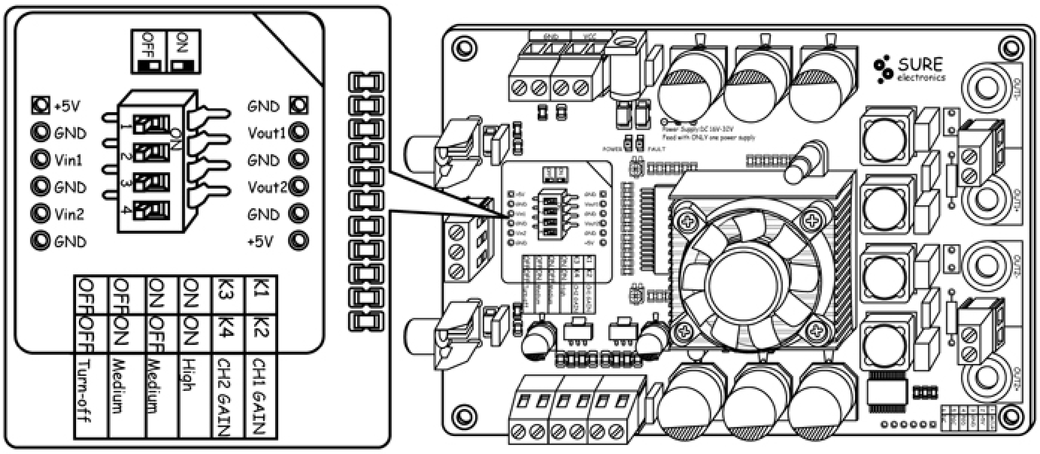


TABLE 2-8 DIP SWITCH SETTING

Switch	K1	K2	Gain Status(dB)
SW2	ON	ON	Weak
	ON	OFF	Low
	OFF	ON	Medium
	OFF	OFF	High

2.6 Notes

In order to protect amplifier board and extend its service lifetime, please read the following warnings carefully since warranties will be voided if you do not observe the following warnings:

Warning 1:

Quality-related issues caused by potentiometers installed by buyers.

Warning 2:

In order to achieve a better sound quality, please use stable power supply since a bad or unstable power supply may worsen the sound quality or even cripple the amplifier board.

Warning 3:

Never equip a pre-amplifier to the audio input since the amplifier itself has powerful amplification ability and a high signal input will burn out the amplifier chip.

Warning 4:

In order to protect amplifier and speaker, please turn the volume output to the minimum when hooking up the amplifier and you may readjust the volume when you are sure that the amplifier is functioning properly.

Chapter 3. Electrical Characteristics

Following table lists all typical data of the Amp board. For full specification, please refer to the data sheet of ST's TDA7492 chip.

TABLE 3-1 ELECTRICAL CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Supply Voltage	AA-AB32189	14V	36V	40V
	AA-AB32174		24V	27V
	AA-AB32165		16V	19V
Quiescent Current（Powered by 19V）	FAN ON,STBY Disable	-	90mA	-
	FAN ON,STBY Enable	-	50mA	-
	FAN OFF,STBY Disable	-	40 mA	
	FAN OFF,STBY Enable		10 mA	
Input Sensitivity（AA-AB32189）	25.6dB	-	1280mV	-
	31.6dB		640mV	
	35.1dB		430mV	
	37.6dB		323mV	
Input Sensitivity（AA-AB32174）	25.6dB	-	910mV	-
	31.6dB		450mV	
	35.1dB		300mV	
	37.6dB		220mV	
Input Sensitivity（AA-AB32165）	25.6dB	-	640mV	-
	31.6dB		320mV	
	35.1dB		210mV	
	37.6dB		160mV	
Gain(SW1 Setting)	K1 ON, K2 ON	24.6	25.6	26.6
	K1 ON, K2 OFF	30.6	31.6	32.6
	K1 OFF, K2 ON	34.1	35.1	36.1
	K1 OFF, K2 OFF	36.6	37.6	38.6
Frequency Range	-	20Hz to 20KHz（±3dB）		
Efficiency	Both channels output rating power.	-	>90%	-
Input Impedance	-	48K ohm	60K ohm	-
Load	-	-	6 ohm	-
Operating Temperature	-	0℃	20℃	50℃

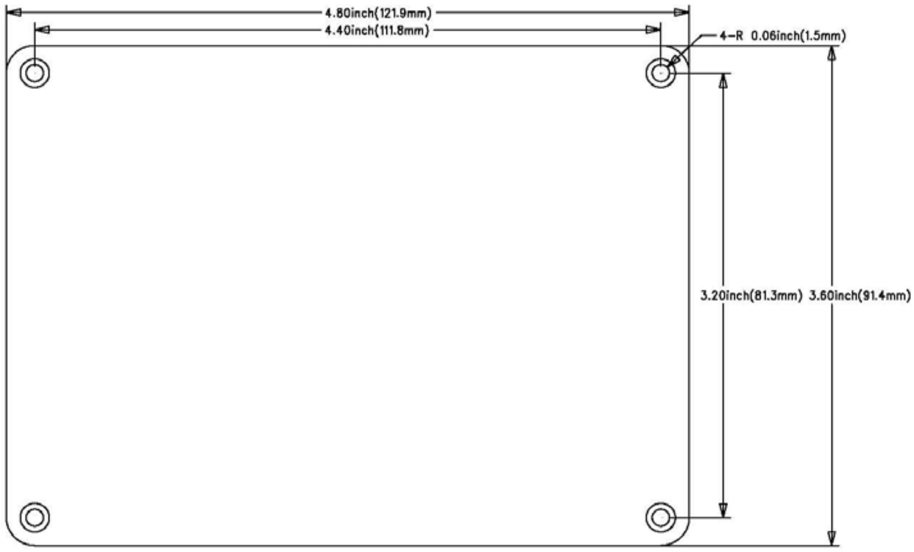
Storage Temperature	-	-20℃	20℃	105℃
Thermal Shutdown	-	-	150℃	-

Note:

1. Stresses beyond the listed maximum power supply voltage may cause the permanent damage to components on board.
2. The input sensitivity values are calculated on the basis of 6 Ohm load.

Chapter 4. Mechanical Drawing

FIGURE 4-1 MECHANICAL DRAWING



Chapter 5. Contact Us

Sure Electronics Co., Ltd.
East zone, 3F, Building 6
Jingang Technology Innovation Center
No.108 Ganjiabian Rd (ZIP: 210000)
Qixia District
Nanjing
P.R.China
Tel: +86-25-68154800-860
Fax: +86-25-68154891-832
Website: www.sure-electronics.com
Email: customerservice@sure-electronics.com